

1 IN THE SPECIFICATION

2 The following paragraphs are rewritten pursuant to 37 C.F.R. §1.121.

3 1. Replace the paragraph beginning at page 9, lines 1 through 2 of the specification with the
4 following paragraph:

5 Figure 8 [in] is a view in section similar to Figure 7, but showing the dunking device fully
6 extended to cause feed material to be released from a container deposited in the apparatus.

7
8 2. Replace the paragraph beginning at page 10, lines 1 through 9 of the specification with
9 the following paragraph:

10 The basic form of the invention shown diagrammatically in Figure 1 provides certain
11 advantages in construction and in handling the required liquid reactant metal by defining release
12 chamber 14, treatment chamber 15, output chamber 16, and heating and conditioning [system]
13 chamber 17, within the single continuous liquid reactant containment vessel 11. However, it will
14 be appreciated that the invention is not limited to this configuration. The various chambers may
15 be formed as separate chambers that are interconnected by suitable conduits or passageways to
16 provide the required transfer of liquid reactant metal and reaction products/feed materials as will
17 be described below. The single containment vessel and separate vessel/chamber configurations
18 are to be considered equivalent for the purposes of the following claims.

1 3. Replace the paragraph beginning at page 14, lines 9 through 21 of the specification with
2 the following paragraph:

3 The output chamber 16 in the form of the invention shown in Figures 2 and 3 is located at
4 the right hand end of treatment chamber 15 in position to receive reaction products and liquid
5 reactant metal exiting the treatment chamber. As best shown in Figure 2, output [Output]
6 chamber 16 is defined in containment vessel 11 between wall 29, vessel exterior walls 70 and 31,
7 and an output or surface collection weir 71. Output chamber 16 also includes a cover to isolate
8 the liquid reactant metal in that part of the system from the atmosphere. The cover includes a gas
9 [recovery] collection/recovery hood 73 which extends above the output chamber 16 in that part
10 of the output chamber immediately adjacent to the end of treatment chamber 15. Output weir 71
11 extends from the top or cover of output chamber 16 down to a level well below the level 41 of
12 liquid reactant metal in the output chamber. Liquid reactant metal may flow readily underneath
13 output weir 71 to exit output chamber 16; however, reaction products and other materials
14 collecting at the surface of the liquid reactant metal in the output chamber are retained in the
15 output chamber to be removed by the reaction product removal arrangement 22 associated with
16 output chamber 16.

17
18 4. Replace the paragraph beginning at page 15, lines 1 through 12 of the specification with
19 the following paragraph:

20 In the form of the invention shown in Figures 2 and 3, the gas removal component 23 of
21 the reaction product removal arrangement 22 (both shown generally in Figure 1) includes a gas
22 removal line 74 connected to receive gases collecting under gas [recovery] collection/recovery
23 hood 73. Line 74 is preferably connected to particle control and recovery equipment (PCE) 75.

1 PCE 75 may include an aqueous scrubber, a bag house, and/or other particle control and recovery
2 devices known in the field of liquid metal treatment systems. Gas removal component 23 may
3 operate under the pressure generated by the collected gases or may include a vacuum
4 arrangement for drawing gasses from the area of gas [recovery] collection/recovery hood 73.
5 Whether a vacuum is applied or otherwise, output chamber 16 may include a gas separation wall
6 76 (shown in FIG. 2) that extends downwardly from the output chamber cover to generally the
7 level 41 (shown in FIG. 3) of liquid reactant metal in output chamber 16 to help retain gaseous
8 reaction products in the area of gas [recovery] collection/recovery hood 73 to be withdrawn
9 through removal line 74.

10
11 5. Replace the paragraph beginning at page 15, line 13 through page 16, line 2 of the
12 specification with the following paragraph:

13 The solids/liquids removal component 24 (shown in FIG. 1) in the illustrated form of the
14 invention includes an auger 78 located adjacent to the end of output chamber 16 next to output
15 weir 71. Auger 78 is driven by an auger drive 79 to scrape off solid materials or slag, and
16 perhaps some liquids, which float on the surface of the liquid reactant metal in output chamber
17 16. These materials removed from the surface of the liquid reactant metal are scraped or directed
18 into a solids removal chute and airlock system shown diagrammatically at reference numeral 80.
19 Although not shown in the drawing, it will be appreciated that solids removal [output] chute and
20 airlock system 80 will include a series of airlock doors or some other arrangement which may be
21 operated to allow solids and liquids collected in the chute to be removed from the treatment
22 system without allowing substantial amounts of air to enter the output chamber.

1 6. Replace the paragraph beginning at page 17, lines 8 through 20 of the specification with
2 the following paragraph:

3 The operation of the form of the invention shown in Figures 2 and 3 may be described
4 with particular reference to the section views of Figures 3 through 5. Figure 3 shows the state of
5 treatment apparatus 10 before the container 46 of feed material is released into the feed area 53
6 of containment vessel 11. In this position, container 46 is held in the feed system isolation or
7 purge chamber 42 between airlock doors 43 and 44, and the area between the airlock doors 43
8 and 44 is purged with a suitable purge fluid. In this form of the invention the purge fluid
9 comprises flue gas which originates from heating chamber [system] 17, and is then conditioned
10 in flue gas conditioning system 40. From this position shown in Figure 3, lower or inner airlock
11 door 43 may be opened to allow container 46 to drop into containment vessel 11 in feed area 53.
12 As indicated in Figure 4, dunker 52 may then be extended to make contact with container 46 as it
13 floats on the surface of the liquid reactant metal at level 41. It will be noted that in this position
14 shown in Figure 4, liquid reactant metal continues to flow into feed area 53 and from the feed
15 area into release chamber 14 as indicated by the arrows.

16
17 7. Replace the paragraph beginning at page 19, lines 1 through 12 of the specification with
18 the following paragraph:

19 After container 46 has been held in the release position for a period of time to ensure that
20 the bulk of the feed material within the container has been released into release chamber 14,
21 dunker member 52 may be retracted from the fully extended position shown in Figure 5. As
22 dunker member 52 is retracted from its fully extended position, the remains of container 46 either
23 [remain] stay on the bottom of containment vessel 11 or float to the surface. The flow of liquid

1 reactant metal into release chamber 14 also flushes any solid or liquid remnants of the container
2 to the right in the figure and generally prevents the material from flowing back into feed area 53.
3 Any pieces of solid material larger than the screen size collect against screen 61 until the material
4 either reacts with the liquid reactant metal or melts or dissolves into the liquid reactant metal.
5 The resulting reaction products or melted or dissolved material continues to flow from left to
6 right in the illustrated treatment system through release chamber 14, treatment chamber 15, and
7 ultimately to output chamber 16.

8
9 7. Replace the paragraph beginning at page 23, line 11 through page 24, line 5 of the
10 specification with the following paragraph:

11 The alternate treatment apparatus 10' shown in Figures 6 through 8 includes a similar
12 containment vessel 11', output chamber 16', heating and [condition] conditioning chamber 17',
13 and circulating system including pumps 85' and 86'. However, in this form of the invention the
14 release chamber 14' comprises generally the chamber that defines the area in which the container
15 46' of feed material is originally deposited into containment vessel 11'. Because container 46'
16 enters the treatment system in the release chamber 14' itself, dunker member 52' is extended by
17 actuator 56' along a vertical axis V in Figure 7, rather than on an incline as shown in the previous
18 embodiment. Treatment apparatus 10' also includes a feed system 20' different from feed system
19 20 shown in Figures 2 through 5. Feed system 20' includes a feed isolation chamber 42' set off to
20 one side of release chamber 14' to accommodate the movement of dunker member 52' along a
21 vertical axis. An inner door 43' and an outer door 44' work in unison to introduce containers 46'
22 into the system similar to doors 43 and 44 described above with reference to Figure 3. Feed
23 system 20' also includes a plunger 45' adapted to be extended with a suitable actuator to push a

- 1 container 46' into release chamber 14' when inner door 43' is opened. Plunger 45' is then
- 2 retracted to allow door 43' to be closed and outer door 44' opened for loading another container
- 3 of feed material into isolation chamber 42'.
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